Carabid Beetle
(*Calosoma austral*)

METAMORPHOSIS

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Aims of Organization

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

Magazine Deadlines

If you want to submit an item for publication the following deadlines apply:
March issue – February 1st June issue – May 1st
September issue – August 1st December issue – November 1st

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Cover Painting

Carabid Beetle (*Calosoma austral*) – Painting by Lois Hughes

From the President

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Diurnal predation of lepidopterous larvae by the carabid beetle *Calosoma austral* Hope 1845 – *Richard Zietek*

Early this year, 5th March 2014, I made a collecting trip to a property called "Noonbah" owned by naturalist Angus Emmott. The property is situated approximately half hour west of Lochern National Park via Longreach. I arrived a week after 5 inches of rain, after a 2 year drought. On the first night I set up a mercury vapour light. The result was amazing. Within an hour I could not walk within 4 metres of the light without treading on *Calosoma* species, *Calosoma shayeri* and *Calosoma austral.* They came in the hundreds. Not much else showed up and what did was attacked by the two species of *Calosoma.*

Light sheet on the 2nd night at " Noonbah" – Photo Angus Emmott

The following night was a complete reversal, the *Calosoma* spp. being still present, but only in small numbers, at least a decrease of 90% to the previous night. The following morning, 6th March, I went collecting on the property. The channels were all running and some too deep to cross with the car, so I went walking through the bush. Two types of *Eremophila* sp. were in full bloom, a blue on the flat plains, and a red on the rocky higher ground (unable to identify). *Acacia aneura,* Mulga, was starting to flower, and there were stands of *Acacia cambagei,* Gidgee. As I walked around in 40 degree heat, I noticed that almost every bush had a *Calosoma austral* moving around inside its branches and leaves.

As I investigated further I noticed that the beetles were actively running down lepidopterous larvae, 3 types of looper caterpillar were observed, and feasting on them, some would escape by dropping on a silken thread. I thought this behaviour unusual as I was under the impression that *Calosoma* were nocturnal predators. I saw no sign of any *Calosoma shayeri* exhibiting this behaviour. The following day even though numbers had decreased *Calosoma austral* were still chasing larvae during the day.

Calosoma austral – Photo John Moss

Calosoma, is a worldwide genus, and is the sole representative of the Carabininae in Australia. The only Australian species are, *Calosoma shayeri* Erich, in the east and south and Tasmania, *Calosoma oceanicum* Perroud in the west, and *Calosoma austral* Hope in Central Australia.

The Ground Beetles, which are the common name for the Carabids, form one of the largest families of beetles. They are classified in 1500 genera and approximately 30,000 described species worldwide. Australian fauna consists of 295 genera and approximately 2,575 described species.

For the record – I have collected one specimen of *C. austral* on the 15-12-1969 at Bulwer Island, Brisbane, one on 23-2-1980 at Camira via Ipswich, and a number at "Noonbah" on 5-3-2014.

References:
The Insects of Australia - CSIRO
A Guide to the Beetles of Australia - George Hangay, Paul Zborowski.

ITEMS OF INTEREST

Teddy Bear Bees, *Amegilla* (*Asaropoda*) - *Erica Siegel*

So far there are 26 species of *Amegilla* (*Asasopoda*) recorded in Australia. Teddy Bear Bees are solitary bees and range in size from 7-20 mm. Most are about 15 mm and are covered in dense red-brown fur with brown hairless stripes on the abdomen, seven for males and 6 for females, but some are a lighter buff colour. As they age the hair on top of the thorax becomes worn and they develop a bald patch.

They are one of Australia's long-tongued bee groups and carry the pollen on special thick fur on their hind legs.

Teddy Bear bees occur in all states of Australia except Tasmania and are usually found along the coast and in the Murray Darling Basin. The largest, Dawson's Burrowing bee (*A. dawsoni*), lives in Western Australia and nests in large groups in clay pans.

Other Teddy Bear bees build shallow 10 cm nest burrows in soft soil, creek banks, in weep holes of retaining walls, in gaps in sleepers surrounding garden beds and sometimes underneath houses. Many females may nest together in the one location but each female builds her own nest containing a cluster of 2 cm urn-shaped cells

made of mud and lined with waterproof secretions. The cells all face upwards and the female stocks each cell with a paste of nectar and pollen on which she lays her egg. The cell is then sealed with a cap. Fully grown larvae may lay dormant until spring if winter is near.

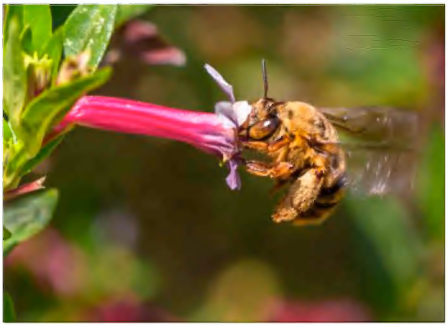
Female Teddybear bees are stalked by the Domino Cuckoo bee, *Thyreus lugubris,* which will lay her egg in unattended nests and the Cuckoo bee larvae will consume the food meant for the larvae of the Teddybear bee.

Teddybear bees are known as buzz pollinators allowing them to pollinate flowers with enclosed pollen like *Solanum* sp., tomato, eggplant, chilli. They grasp the flowers with their front legs and use their flight muscles to vigorously vibrate the flower, thus dislodging the pollen. They are valuable pollinators of native wildflowers and forage on native flowers like *Senna clavigera, Hibbertia scandens, Hibbertia dentata, Dianella, Melastoma affine,* and exotic *Buddleja davidii* and *Cuphea* sp.

The males roost together at night in small groups by hanging onto stems or twigs with their mandibles.They have been observed roosting near the roost of Blue-banded bees and sharing the same twig with a Blue-banded bee.

Reference:
Dr. Anne Dollin (Australian Native Bee Research Centre)
Further Reading:
Photos and information
http://www.aussiebee.com.au/teddy_bear_bee.html

Photos Erica Siegel



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Moths of Tropical North Queensland – *Graham J. McDonald*

Introduction

Last June and July, my wife and I returned to Cape York Peninsula to photograph butterflies and moths at Kutini-Payamu (Iron Range) National Park and several other places in the Wet Tropics.

Moths were attracted to a light sheet powered by a 250 W mercury vapour light and generator. Over 550 moth images were taken using a Canon 450D DSLR camera and a Tamron SP 60 mm F/2 macro lens. Only 15 selected photos are seen here of the most spectacular species. The weather on Cape York at this time was mostly fine with a few brief showers at Iron Range and Babinda. Temperatures varied from 18°C at night to 27°C during the day.

Moths and butterflies can mostly breed all year round but there is a peak in the wet season, when the roads in this area can become impassable. Light sheets were run in 13 locations from Iron Range to Murray Falls. Many of the moth images are yet to be identified to the species level but most have been given a Family or Genus status.

Fig. 1a

Fig. 1b

Fig. 1a
FAMILY EUPTEROTIDAE
Cotana neurina - male
Cook's Hut Campground, Kutini-Payamu (Iron Range) National Park
G.P.S. 12°42'36.6" S 143°17'33.09" E

Cotana neurina is a large moth found only from Cape York to Iron Range. The larvae probably feed on *Melaleuca* spp, including *M. quinquenervia*, which are plentiful in lowland paperbark forests. They are some of the first moths to land on a light sheet. The males and females (see Fig. 1b) demonstrate sexual dimorphism with the females being much larger and differently patterned. Males are very common here but the females were seldom seen.
A similar moth, *C. serranotata*, is found further south around Cairns.
Fig. 1b
F: EUPTEROTIDAE
Cotana neurina (female)
Cook's Hut Campground, Kutini-Payamu (Iron Range) National Park
G.P.S. 12°42'36.6" S 143°17'33.09" E

Fig. 2

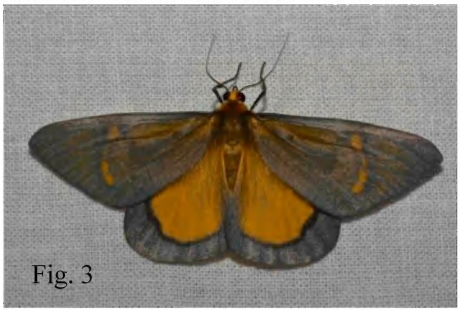
Fig. 3

Fig. 2
F: GEOMETRIDAE, S/F: ENNOMINAE
Capasa incensta (male)
Cook's Hut Campground, Kutini-Payamu (Iron Range) National Park
G.P.S. 12°42'36.6" S 143°17'33.09" E
Capasa incensta is a medium-sized moth found in Cape York rainforests. The coloration of the wings is quite variable with the background varying from a grey-green to rusty or pale brown. The transverse bands on the wings can be green, khaki or yellowish. All variations have the forewing costa orange. A second species *Capasa recensata* has a broad band transversing the forewing.
Fig. 3
F: GEOMETRIDAE, S/F: OENOCHROMINAE s. lat.
Celerena griseofusa
Old Coen Walk, Kutini-Payamu (Iron Range) National Park
12°44'14.43" S, 143°15'42.87" E
This large moth was attracted to light traps set up in a variety of vegetation types including tropical rainforest, moister savannah woodland and areas dominated by *Melaleuca* spp.

Fig. 4a

Fig. 4b

Fig. 4a
F: GEOMETRIDAE, S/F: GEOMETRINAE
Dysphania fenestrata (Four o'clock moth)
Gordon Creek, Kutini-Payamu (Iron Range) National Park
G.P.S. 12°42'54.49" S, 143°18'5.19" E
This very large moth flies in the late afternoon, hence the common name. This moth was photographed in its natural surroundings. They are easily captured by hand just after they land. The larva (Fig. 4b) feeds on the corky bark carallia, *Carallia brachiata*.

Fig. 5

Fig. 6

Fig. 5
F: ARCTIIDAE, S/F: ARCTIINAE
Spilosoma erythrastis
Gordon Creek, Kutini-Payamu (Iron Range) National Park
G.P.S. 12°42'54.49" S, 143°18'5.19" E
This large colourful moth can show some variability with the bold black area on the hindwings reduced to black dots. The natural distribution is between Iron Range and Babinda.
Fig. 6
F: GEOMETRIDAE, S/F: GEOMETRINAE
Gelasma orthodesma (male)
Gordon Creek, Kutini-Payamu (Iron Range) National Park
G.P.S. 12°42'54.49" S, 143°18'5.19" E

A medium to large emerald Geometrid moth found from Iron Range to the Cairns area.

Fig. 7

Fig. 8

Fig. 7
F: CRAMBIDAE, S/F: SPILOMELINAE
Cydalima pfeifferae
Cook's Hut Campground, Kutini-Payamu (Iron Range) National Park
G.P.S. 12°42'36.6" S 143°17'33.09" E
A medium sized very beautiful moth with a silken sheen. A similar species, *C. laticostalis* is found near Cairns.
Fig. 8
F: GEOMETRIDAE, S/F: ENNOMINAE
Milionia queenslandica
Tully Gorge Camping Area, Tully Gorge National Park
G.P.S. 17°46'26.17" S, 145°39'1.68" E
A large spectacular moth found from Cooktown to Mackay. They are closely related to colourful day-flying moths from New Guinea but they are not as strongly diurnal, coming to light at night. The larval food plant is unknown but it could be *Podocarpus* spp.or *Prumnopitys* spp

Fig. 9

Fig. 10

Fig. 9
F: GEOMETRIDAE, S/F: ENNOMINAE
Bracca rotundata

Tully Gorge Camping Area, Tully Gorge National Park
G.P.S. 17°46'26.17" S, 145°39'1.68" E
A large boldly patterned Geometrid moth found from Cape York Peninsula to Eungella. The food plants are *Wilkiea* spp and *Tetrasynandra* spp (F: MONIMIACEAE). See article in Metamorphosis Australia No. 72, p. 15 - 17.
Fig. 10
F: SATURNIIDAE, S/F: SATURNIINAE
Cascinocera hercules (Hercules Moth) - male
Tully Gorge Camping Area, Tully Gorge National Park
G.P.S. 17°46'26.17" S, 145°39'1.68" E
This extremely large moth occurs in rainforest from Cape York south to Ingham. The female is one of the world's largest moths with a wingspan of over 25 cm. The food plants vary and include *Homalanthus nutans* (Bleeding heart tree), *Glochidion ferdinandi* (Cheese tree), *Dysoxylum mollissimum* (Red bean), *Polyscias elegans* (Celerywood) and other species.

Fig. 11

Fig. 12

Fig. 11
F: CRAMBIDAE, S/F: ACENTROPHINAE
Tetrernia terminitis
Babinda Boulders
G.P.S. 17°20'26.84" S, 145°52'15.69"E
This small-medium colourful moth is found from Cape York south to at least Ingham in and near rainforest and wet areas. It belongs to a group of moths that have aquatic larvae as well as being boldly patterned.
Fig. 12
F: CRAMBIDAE. S/F: SPILOMELINAE
Glyphodes callipona
Coen
G.P.S. 13°56'5.86" S, 143°11'57.21" E
The Glyphodes moths are generally small to medium with transparent wing panels. They come readily to light but can be found on the wing in daylight. Their habit of landing under leaves makes them difficult to photograph in their natural habitat.

Fig.13
F: CRAMBIDAE, S/F: ACENTROPHINAE
Theila siennata
Old Coen Walk, Kutini-Payamu (Iron Range) National Park
G.P.S. 12°44'14.43" S, 143°15'42.87" E
Another aquatic species found from Iron Range south to at least Tully.

Photos Graham Macdonald

References:
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Herbison-Evans, Don and Crossley, Stella http://lepidoptera.butterflyhouse.com.au
Richardson, B. (2008) *Mothology: Discover the Magic* LeapfrogOz
Zborowski, P. and Edwards, E. D. (2007) *A Guide to Australian Moths* CSIRO Publishing

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Life history notes on the Small Grass-yellow, *Eurema smilax* (Donovan, 1805) Lepidoptera: Pieridae - *Wesley Jenkinson*

The Small Grass-yellow is encountered across much of mainland Australia being the most widespread species in the genus. This species is encountered in a variety of open habitats where the host plants are established chiefly in grasslands, open woodland, eucalypt open-forest and occasionally in suburban gardens. Small migrations of this species occur depending on regional rainfall and the availability of host plants.

The adults fly close to the ground amongst grasses. When disturbed they can fly quite rapidly and can be difficult to follow. The adults are active during warm sunny conditions, but tend to settle during cloudy periods only to take flight again when the cloud has cleared. Both sexes feed from a variety of small native and introduced flowers.

Whilst in flight, the adults can be very easily confused with other species in the genus. In comparison to other *Eurema* spp. the adults are generally smaller and the forewing is slightly narrower with the apex more rounded. The shape and position of the black apex pattern on the forewing upperside will also help place this species. Voucher specimens are best for correct identification.

The sexes are quite similar in appearance. Males have an elliptical shaped sex brand (sex scales) along vein CuA on the underside of the forewing (Common & Waterhouse) and the females are slightly paler yellow. This species shows variation on the hindwing upperside, with some specimens having dark terminal markings while others have small black spots at the end of the veins. This species has a considered wet and dry season form where the brownish underside markings vary

considerably. The dry season form usually has heavier markings than the wet season form in which the markings can be absent. Intermediate specimens also occur.

Wingspans for the adults pictured are 30mm for the males and 33mm for the females

Eurema smilax (Small Grass-yellow)
Images top left to right: male, female, male underside, female underside (intermediate forms)

Image lower left to right: male underside (wet season form), male underside (dry season form), female (showing dark terminal markings)

Females oviposit eggs singly on either side of fresh and mature leaves of the host plant. On taller *Senna* plants, the females have a preference to deposit the eggs on the leaves closest to the ground particularly if spindly grass is growing through the plant.

In January 2004 at Beaudesert a female was observed slowly fluttering around a small cultivated host plant *Senna surattensis*, she settled on the host plant and curled her abdomen on to the upperside of a leaf ovipositing a single egg. While egg-laying, her wings remain closed. This egg was kept for life history studies.

This egg was creamish white, spindle shaped with very fine longitudinal ribs, approximately 0.5 mm wide x 1.3 mm high

Freshly laid egg

When the first instar larva emerged, most of the eggshell was consumed shortly afterwards. It was observed feeding during daylight hours feeding from the outer edge of the leaves and resting on either side of the leaves of the host plant. The larva raised completed five instars and attained a length of 18mm.

1st instar larva

2nd instar larva

3rd instar larva

4th instar larva

5th instar larva

Pre-pupa lateral view

Pupa lateral view

Pupa with brown markings

In captivity the pupa, measuring 15mm in length, was located below a stem of the host plant. It was attached with silk by the cremaster and a central girdle. Pupae occasionally have brownish markings camouflaged to match the stem colour as pictured. Adults raised in captivity in November 2007 emerged around 7.00 am.

The total time from egg to adult was egg duration of 4 days, larval duration 23 days and pupal duration of 13 days.

Within the new boundary of the Scenic Rim Regional Shire south of Brisbane, I have records of adults from all months of the year. In this region the adults appear to be more numerous during the summer and autumn months. However, this probably relates to the timing of local rainfall triggering fresh growth of the host plants.

Photos Wesley Jenkinson

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New Distribution Records for Sulphur and White Butterflies (Lepidoptera: Pieridae) in inland and outback Australia –

Kelvyn L. Dunn

Summary

This paper documents 49 new locations in inland and outback Australia for 11 Pierid butterflies (namely, *Catopsilia pyranthe*, *C. pomona*, *Eurema laeta*, *E. herla*, *E. smilax*, *E. hecabe*, *Elodina parthia*, *El. walkeri*, *Cepora perimale*, *Delias argenthona* and *D. aganippe*). Each record falls outside the boundaries of the species' distributions, as indicated on the range-filled maps provided by Braby (2000). The

report also discusses relevant new locations discovered by others since 2000, namely, those that lie close to any listed in this paper, but in doing so it does not reiterate historic distributions that underpin Braby (2000). The many new locations for the species tabled provide ongoing evidence that there remains much to learn about butterfly species' distribution in inland Australia.

Introduction

Those insect enthusiasts who occasionally visit remote areas of Australia may pay little attention to the Sulphurs and Whites, a group of butterflies whose members are small to moderately sized, and which are usually conspicuous on the wing and readily identified. The Sulphurs are often quite fast and steady fliers (many are migratory) but can be effortlessly photographed (and easily identified by this means) when they pause to feed at flowers, or when they roost on low foliage in the evenings and during unsuitable weather for sustained flight. Some of the Whites can be weak and slow fliers (e.g. *Elodina*) yet others are robust and fast (e.g. *Appias*). The Jezebels (*Delias*) often have stunning aposematic patterns (to warn predators), their scarlet splashes are eye-catching against the darker, underside wing markings; they present as slow flying and showy on patrol, as they circle and glide, often high up amongst the taller trees. Regular observations by casual observers have built up a substantial knowledge of the distributions of Pierid butterflies because their members, like those of the Swallowtails (Papilionidae) (see Dunn 2013a for a complementary piece on that group), are very noticeable in areas where they occur. Despite their visibility, the known distributions for some of the more widespread and common species, as per the Swallowtail group, are still patchy, fragmentary, and likely under-representative beyond the coastal and sub-coastal regions where most butterfly fieldwork is repeatedly done (Dunn 2010). That paucity of knowledge applies especially to those species that periodically disperse inland along major river systems, from moister upland regions of the western slopes of the Great Dividing Range in eastern Australia, or from floristically richer regions nearer the eastern coast after traversing the range. It is possible that *Delias argenthona* (Scarlet Jezebel) is one of those species that expands considerably inland and may breed seasonally or opportunistically (in those more favourable years) along river systems during late winter and early spring, prior to the hot and dry summer period in southern inland Australia, where, at which time it is unlikely to be found. The surprising new record of several adults of this species along the Murrumbidgee River, in the township of Bourke, remote from other known locations, would support this suggestion.

Methods

During two lengthy field trips across inland New South Wales and outback Queensland (see Dunn 2013b for map of sites visited), I pragmatically recorded Pierids (and all other butterflies) in order to help alleviate the knowledge imbalances that exist for the inland of eastern Australia (Dunn 2009, 2010). I utilised a 'roadside explorative approach' that involved examination of numerous sites along major highways and byroads, en route back and forth to the Gulf Country; sites were

selected according to the various types of habitat available and where these habitats showed less human disturbance. I routinely walked slowly through each site visited (often involving a 15-30 minute inspection), and in process listed all species encountered that could be positively identified by various means (netting, photography and close observations). Most inspections occurred between about 0900 and 1730h (AEST) each day for the entirety of each trip, usually irrespective of the weather, with focus on sunnier periods to maximise encounter rates with adults (the main life stage sought).

I identified many of the adults seen without the requirement of handling; least interference was the option aimed for where the record was thought, at the time, to be mundane. Those twenty-seven (27) encounters (50.0%) recorded by 'observation-only' are marked (Obs.). For 26 (96.3%) of these observations the identifications were certain (Category 1). In each case, I recognised sufficient characters to achieve that level of confidence. One observation was to a level of 'almost certain' (Category 2) as the field circumstances did not permit sufficient time and closeness to identify the species to a level beyond reasonable doubt on that occasion. Yet, I felt sufficiently confident that it was the species that I believed it to be, based on (one or more) behavioural traits noted, through use of a process of elimination of unlikely species, and in conjunction with experiential knowledge. That lower grade record is marked 'C2' (see Dunn 2011a for discussion of these and other categories of record acceptability) to distinguish it as less reliable as observations go; nonetheless the distribution it suggests is quite believable and it was not far from the inland boundary, previously recorded (Braby 2000).

I retained voucher specimens at times, and more often than not, these were from locations where the species concerned were far beyond their known ranges. For that reason, the percentage of vouchers in the Table (35.2%) is much higher than the usual frequency for all records (because the table is selective data and lists only those records that represent new locations). Sometimes vouchers were not obtained when, perhaps, this ought to have been done in order to improve the survey rigour; the reason for this was mostly because, on some occasions I did not recognise that a particular location was evidence of new distribution at the time of the field encounter. Occasionally too, some adults suspected of being from new or perhaps cusp locations were handled (to confirm their identification, in the event that it might be challenged) and then released unharmed (Rel.) (11.1%); those specimens in poorer condition (i.e. with serious wing wear) were released as routine practice. A small portion of records were photographed (18.5%) where this was possible in the field, and these serve as supportive evidence that can be examined by others, should this be required (some are reproduced in this report to substantiate those encounters). At times, I retained adults that had posed for video photography, if they lingered unduly (but oftentimes they would quickly depart on my closer approach); where retained as a specimen, these are included among those marked as vouchers, but each includes a superscript-link to the photos (video frames) concerned. (On occasion, I photographed some again, usually

in late afternoon or early next morning; at these times outdoor lighting was more subdued (creative of less shadow). When the adult was placed in an open area (away from distracting tangled vegetation where they may otherwise chose to perch), this often enabled a much improved image compared with the more natural event). Where records standalone as image-only (meaning the specimens were not retained) these are marked as 'Photo' (0.6%).

The method used to measure distances, and define locations to precision of within a kilometre of the actual site, has been described previously (Dunn 2013c); extended discussion and other recommendations to help describe locations effectively and, in process, to avoid ambiguity are detailed elsewhere (Dunn 2013d) and not reiterated. Finally, some records from other field trips have been included too where these are new locations for the regions concerned, and not published elsewhere.

Results and Discussion

Table 1 (a & b) lists 54 records of 11 species from 49 new locations (arranged from north to south), across three states in Australia; all sites fall outside the boundaries defined by Braby (2000) for the species concerned and so are new on that criterion. References to findings of other workers in the last decade (or so), are cross-linked where their published new locations fall close to those listed. For *Elodina parthia* and *D. argenthona* the new locations are evidence that these two species extend notably farther inland in Queensland (and for the latter species, farther inland in New South Wales as well), than was formerly believed. For *Eurema laeta* the new records from the Normanton area provide evidence of what is likely to be a continuous distribution through the coastal region of the Gulf Country. For the other Pierid species, some of the extensions may be minor but each provides evidence of a broader inland occurrence in the area concerned than was known previously. Most of these new records link in to an inadequate knowledge of species' distributions – a lack of regular exploration of the inland by insect enthusiasts – rather than because of unusual or localised climatic conditions (that were present in southeastern Australia for some of the years concerned). Each record adds insight into the distribution of those species of butterfly in the inland and helps fill knowledge gaps evident in their distributions (based on the range-fill maps in Braby 2000).

Acknowledgements

Dr John Moss kindly identified the *Atalaya* species from a series of photographs of the flowers and foliage from the sites concerned, and identified the *Lysiana* and *Sida* species (the last mentioned to genus) based on the photographs included. (The writer identified all other plants mentioned.)

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Key to Table:

Note 1. A male (dry season form) of *C. pyranthe* was netted as it fed at the flowers of garden-grown bushes of *Duranta erecta* (dark purple-flowered variety) (Verbenaceae) between 0900-0930h AEST near the entrance to a caravan park, east of the town centre.

Note 2. A female *C. pomona* was seen as it fed at the flowers of Grey Mistletoe, *Amyema quandang* (Loranthaceae) between 1030-1200h AEST in remnant woodland along the roadside. (I did not record the seasonal form of the adult in my field note diary, but it would have been the dry season form on circumstantial evidence).

Note 3. The adult of *E. herla* was photographed as it fed at a *Sida* sp. (Malvaceae) (between 1430-1520h AEST), in spinifex woodland at the entrance to the National Park.

Note 4. A solitary male *E. hecabe* taken, whilst feeding at a flower of *Duranta erecta* L. (dark purple-flowered variety) (Verbenaceae) between 0900-0930h AEST, may represent a record of vagrancy at this disjunct and inland location. A number of unusual range expansions for various species of butterfly and moth were reported over the 2010-2012 period in southeastern Australia (Dunn 2011b,c Halsey 2011, Dunn & Field 2012, Faithfull & Dunn 2012, Morton 2012, Hewish & Hewish 2013, Haywood 2014), and this encounter may be linked to that phenomenon.

Note 5. Atkins et al. (2003) and Meyer et al. (2013) each recorded *El. parthia* at one or more sites in White Mountains National Park; this wilderness region is also outside the range given by Braby (2000) but is not as far inland as this new record.

Note 6. A male of *El. parthia* was netted as it fed in company with a few adults of *Nacaduba biocellata* and numerous *Zizina otis* (between 1535-1625h AEST), at a flowering Whitewood, *Atalaya hemiglauca* (Sapindaceae) growing in a cleft near the mesa escarpment, in woodland.

Note 7. Valentine and Johnson (2000: 60) broadly recorded *El. parthia* as present "between St George and Cunnamulla", which presupposes a more or less continuous range across that part of inland southern Queensland. Their statement of distribution would infer that the species was found at (or in

suitable habitat nearby at) both end-point towns listed, and that it presumably occurred at one or more sites in between as well (as internally supportive). (However, if those authors had actually intended just one or more locations midway (rather than the endpoints), then they presumably would have listed those specific locations with a road distance, as they did for other species). I took one male and saw another (which was likely a male as well) at this new location; my record from Hebel (a border settlement situated SW of St George) is well beyond the distribution provided by Braby (2000) and is southwardly adjunctive to the updated and enlarged distribution given by Valentine and Johnson (2000).

Note 8. The solitary worn male of *C. perimale* taken flying in Acacia woodland, may represent a record of vagrancy at this inland location; the adult approached the form with the brown hind wing underside. A number of unusual range expansions for various species of butterfly and moth were reported over the 2010-2012 period in southeastern Australia (see supportive references in Note 4).

Note 9. An aged female of *D. argenthona* was seen repeatedly flying about *Lysiana subfalcata* (Loranthaceae) at the Barcoo River crossing, at 42 km ESE of Blackall, Qld; it did not oviposit in my presence and there were no flowers evident to attract it, but it appeared to be visually inspecting the plant and/or, perhaps, responding to olfactory cues. *L. subfalcata* is not a known larval host that I am aware of, but this Jezebel has been reported from *L. maritima* (Moss 2005), which was based on my personal observation at Twin Waters, near Maroochydore Qld (Dunn 2007, Moss 2007).

Note 10. The presence of several males of *D. argenthona*, mostly seen flying high up about the crowns of tall River Red Gums growing on the levy, would suggest a local breeding population had established along the Murrumbidgee River system at this location, far beyond the known distribution of this species in NSW. Their presence may have represented a temporary range expansion that occurred during several wetter-than-usual seasons (see commentary for Note 3). A male was taken after it descended to feed, several metres above ground, alongside some females of *Papilio demoleus*, at a tall, garden-grown, Crimson bottlebrush (*Callistemon* sp. probably *viminalis*; Myrtaceae) between 1030-1040h AEST. There are very few observations of butterflies available for this township (as well as for that general area of outback NSW), and I did not chance upon any more of the Scarlet Jezebel on a return visit in December 2013; I call on others to gather evidence as to whether this butterfly is a regular resident at Bourke.

Note 11. A male of *D. aganippe* was seen feeding in company with *Nacaduba biocellata* and *Zizina otis*, at a flowering Whitewood *Atalaya hemiglauca* (Sapindaceae) in open woodland, between 1300-1320h AEST.

Note 12. A few males of *D. aganippe* were seen patrolling the taller trees adjacent the roadside rest area, in mid-afternoon, between 1400-1425h AEST. One male descended to feed, albeit still several metres above ground, at the flowers of Grey Mistletoe, *Amyema quandang* (Loranthaceae), whereupon it was netted. About a kilometre farther up the road (at 25km NW of the township), I saw several males of *Belenois java*, a female of *Elodina padusa*, a male of *Theclinesthes miskini* as well as an unsexed adult of *Nacaduba biocellata* feeding at flowers of Grey Mistletoe, earlier in the afternoon that same day. In addition, an adult of *Lampides boeticus* flew about the mistletoe flowers briefly, then perched on foliage nearby (which overlooked the flowers), but it did not feed whilst I watched on that same visit. This roadside strip of mixed woodland, buffered by dense and tall Mitchell grass, seemed quite rich in butterflies, and across two visits (October 2011 & 2012), I recorded adults of 17 species in the 1.1km stretch from the rest area – a sizeable tally for the inland in this region.

Table 1a. Forty-nine new locations for species of Pieridae from beyond their known ranges in Australia

Species/Location	State	Geocode	Date
Catopsilia pyranthe			
Bladensburg historic homestead, at woolshed	Qld	22°30'S, 143°02'E	06 Oct 2012
1.6km NE by E of Charleville	Qld	26°24'S, 146°15'E	28 Sep 2012 30 Sep 2012
Bogan River bridge, at 1.3km NW by W of Nyngan	NSW	31°33'S, 147°11'E	16 Dec 2013
95km N by W of Condobolin	NSW	32°19'S, 146°58'E	16 Dec 2013
C. pomona			
Muttaburra	Qld	22°36'S, 144°33'E	04 Oct 2012
Aramac, N of Barcaldine	Qld	22°58'S, 145°14'E	04 Oct 2012
1km S of Barcaldine	Qld	23°34'S, 145°17'E	04 Oct 2012
Isisford	Qld	24°16'S, 144°26'E	03 Oct 2002
Blackall	Qld	24°26'S, 145°28'E	02 Oct 2012
16km W by S of Blackall (along road to Isisford)	Qld	24°27'S, 145°20'E	03 Oct 2012
24km NW by rd of Tambo	Qld	24°45'S, 146°06'E	26 Oct 2011
Tambo	Qld	24°53'S, 146°15'E	02 Oct 2012
18km N of Augathella	Qld	25°39'S, 146°36'E	01 Oct 2012

41km NNE of Charleville	Qld	26°06'S, 146°25'E	01 Oct 2012
1.6km NE by E of Charleville	Qld	26°24'S, 146°15'E	30 Sep 2012
11km S by W of Charleville	Qld	26°29'S, 146°13'E	25 Oct 2011
12km S by W of Charleville	Qld	26°30'S, 146°12'E	25 Oct 2011
25km S by W of Charleville (at 4km N of Angellala Creek)	Qld	26°37'S, 146°10'E	25 Oct 2011
Eurema laeta			
Walker Creek, at 28km by road NNE of Normanton	Qld	17°28'S, 141°11'E	12 Oct 2012 13 Oct 2012 14 Oct 2012
Normanton, at drain near Travers Street	Qld	17°41'S, 141°04'E	12 Oct 2012 14 Oct 2012
E. herla			
Craggs grave, 27km SSW by road of Winton	Qld	22°34'S, 142°57'E	06 Oct 2012
Surprise Creek, at Top Crossing, at southern boundary of Bladensburg National Park	Qld	22°34'S, 142°58'E	06 Oct 2012
E. smilax			
27km E of Norseman	WA	32°05'S, 122°01'E	10 Oct 2008
13km N of Scaddan (at Truslove Road junction)	WA	33°19'S, 121°42'E	15 Oct 2008

Table 1b. Forty-nine new locations for species of Pieridae from beyond their known ranges in Australia (*continued*)

Location	State	Geocode	Date
E. hecabe			
1.6km NE by E of Charleville post office (at van park)	Qld	26°24'S, 146°15'E	30 Sep 2012
Elodina parthia			
Bottle Tree Lookout, 58km NE of Hughenden	Qld	20°28'S, 144°24'E	28 Oct 2011
18km SE by E of Winton, in cleft on mesa	Qld	20°29'S, 143°11'E	05 Oct 2012
24km NW by rd of Tambo	Qld	24°45'S, 146°06'E	26 Oct 2011
25km SE of Tambo, at highest point on road	Qld	25°01'S, 146°26'E	02 Oct 2012
Tara River, at Hebel	Qld	28°58'S, 147°48'E	17 Nov 2011

El. walkeri			
Chillagoe	Qld	17°09'S, 144°31'E	12 Jan 2002
5km SE of Chillagoe	Qld	17°11'S, 144°33'E	12 Jan 2002
Cepora perimale			
11km N by E of Roma	Qld	26°28'S, 148°48'E	14 Nov 2011
10km SE by S of Hebel	NSW	29°02'S, 147°52'E	17 Nov 2011
Delias argenthona			
Walker Creek, at 28km NNE of Normanton	Qld	17°28'S, 141°11'E	14 Oct 2012
1km S of Barcaldine	Qld	23°34'S, 145°17'E	04 Oct 2012
Barcoo River bridge, Isisford	Qld	24°16'S, 144°27'E	03 Oct 2012
Barcoo River at 42km ESE of Blackall	Qld	24°35'S, 145°49'E	02 Oct 2012
25km NW by rd of Tambo	Qld	24°45'S, 146°06'E	02 Oct 2012
Tambo	Qld	24°53'S, 146°15'E	01 Oct 2012
29km NNE of Charleville	Qld	26°11'S, 146°22'E	30 Sep 2012
1.6km NE by E of Charleville	Qld	26°24'S, 146°15'E	30 Sep 2012
Wyandra (in hotel rear garden off Warrego Street)	Qld	27°15'S, 145°59'E	27 Sep 2012
1km S of Cunnamulla (at van park)	Qld	28°05'S, 145°41'E	27 Sep 2012
Darling River at Bourke, near Short St (close to Rotary Park)	NSW	30°05'S, 145°57'E	26 Sep 2012
D. aganippe			
39km E of Isisford	Qld	24°16'S, 144°48'E	03 Oct 2002
16km W by S of Blackall	Qld	24°27'S, 145°20'E	03 Oct 2012
24km NW by rd of Tambo, at picnic area	Qld	24°45'S, 146°06'E	02 Oct 2012
Beacon Hill Lookout, 1.6km E of Norseman	WA	32°12'S, 121°49'E	10 Oct 2008 13 Oct 2008

Fig. 1

Fig. 2

Fig. 3

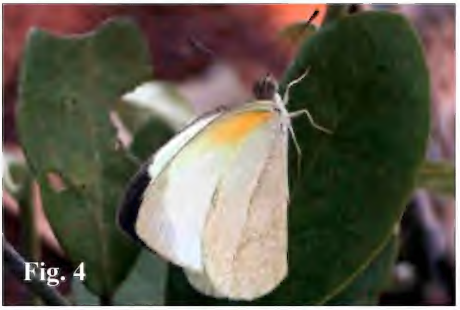
Fig. 4

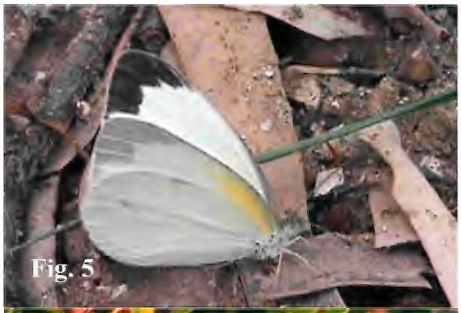
Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Fig. 10

Photos Kelvyn Dunn

Key to Figures:
1. *E. laeta.* Female; feeding at damp sand near drain at Normanton, Qld.
2. *E. herla*. Surprise Creek, at Top Crossing, at the southern entry to Bladensburg National Park, Qld.
3. *El. parthia*. Female; 24 km NW of Tambo, Qld.
4. *El. parthia*. Male roosting; 25 km SE of Tambo, Qld.
5. *El. parthia*. Male at Tara River, near the Hebel Hotel, Qld.
6. *El. walkeri*. 5km E of Chillagoe, Qld. feeding at undetermined flowers
7. *C. perimale*. Roosting male; 11 km N by E of Roma, Qld.
8. *D. argenthona*. Barcoo River, at 42 km ESE of Blackall, Qld.
9. *D. argenthona*. Male; 29 km NNE of Charleville, Qld.
10. *D. argenthona*. Male; perched high up on eucalypt in hotel garden, at Wyandra, Qld

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Life History of a Diurnal Lepidopterist! – *Tony Morton*

It was wartime, 1943. My father worked for the Indian Civil Service in Delhi. Aged eight, I was sent to boarding school in Simla, at B.C.S. (Bishop Cotton's School otherwise known as Best Cooked Sausages). Simla lies at some 7,000 feet in the Himalayas, and because of the long, snowy winter we had a three month holiday then and two ten-day holidays separating the three terms. There was a large buddleia bush at the edge of the sports field, and several of us would swipe away with our nets at the wonderful variety of butterflies that came along in plenty. I've still got a few in one of my cases, finally mounted after following me around in a cigar box for forty years!

We had our own names for them, the 'Peacock Monal' *(Papilio paris)* was a prize, as were the other Swallowtails *(polyctor, krishna, palinurus)*, which we called Monals indiscriminately. My father told me that Monal was the vernacular name for the Himalayan Pheasant, which also has a magnificent iridescent blue and green plumage. Then there were the 'Rice Monals', *(P. polytes,* perhaps) called this because of the white spots along the termens of the wings, shaped like grains of rice. Others were just 'Riceys'. I imagine these must have been various *Euploeas.* We called *P. demoleus* the 'Cornflower', *Cyrestis thyodamus* the 'Mappy', *Junonia orithya* the 'Lady's Fancy', *J. hierta* the 'Gentleman's Fancy', *Kaninska canace* the 'Blue Admiral'. There were also many Little Brown Jobs (probably *Ypthimas*) we saw on walks. We called them 'Hoppys' and believed they were a sign of rain coming! I'm ashamed to say we took no notice of the Blues and Skippers (which are of such great interest to me now), considering them of no use to man nor beast!

Some of us kept large beetles, Stag, Rhinoceros, Hercules, in our pockets, happily sucking on a quarter of apple, making a contented buzzing sound (the beetles, not us!). We would put them on the table and try to make them 'fight'. They would lumber towards each other, often missing their opponent but sometimes colliding. When they did, it was usually the Rhino that would 'win'. His frontal 'horn' could tip the opposing beetle over on its back. A cheer would go up.

Then it would be supper time. We sat in tables of eight. The 'bearers' always impressed me enormously. They would be loaded up with eight full plates, four on each arm, and serve the whole table by shrugging each pair down their arms until the last pair was in their hands! I don't remember one plate ever being dropped. I longed to be a bearer when I grew up.

During one ten day holiday I stayed with my mother in a Simla hotel. My father couldn't get away from Delhi because of work. I met a delightful man whom I later realized was a real collector, but of moths. His room smelt splendidly scientific for it was also his laboratory. He was breeding moths in cages. We went out after nightfall and walked round the streets of Simla seeing what moths had been attracted to streetlights. He gave me the cocoon of an Indian Moon Moth. I kept it in a box for a long time. Eventually the moth emerged and the most beautiful thing it was, pale green with pinkish veining and astonishingly long, delicate tails.

Then we went back to England where I found things very dull by comparison, though I do remember a wonderful flight of Clouded Yellows *(Colias croceus)* in autumn 1947, I think. Cricket and football were now claiming my attention. They seemed important to me then, though now I feel my spare time could have been far better spent studying Natural History! Besides, instead of playing Army cricket in Hong Kong, where I was doing National Service, I could have been sitting at the feet of Colonel J. N. Eliot, specialist in the *Lycaenidae*, who was serving there too in 1955. I only discovered this years later. It was also years later that I found out that I had spent a year in Switzerland almost next door to Vladimir Nabokov, novelist and taxonomist, particularly expert on Alpine butterflies. He was living in a Montreux hotel at the time, 1966. I was teaching at a school nearby wasting time again coaching various sports instead of getting to know Nabokov who by then, I believe, only had time for, and was only civil to, other butterfly collectors!

But all was not lost! In 1969 I came to Melbourne and though Victoria has only about 100 species of butterfly, and the whole of Australia only about 400 (compare this with the island of Singapore which has (alas, now, had?) 1200 species at least!), I found a lot of my old friends from the buddleia bush in Simla here, especially in North Queensland, and have been very interested in them ever since.Now (2014), worried about the collection as I was losing interest and not taking care of it, I tried to leave it to an Australian museum, but there was so much 'foreign' material in it they didn't want all of it and I was unwilling to split it up. I also tried the Hope Museum at Oxford, but I would have had to pay for the packing and shipment myself. So I have given it to Florida University (McGuire Institute). This is a highly regarded Institute of Biodiversity. They sent a curator out to stay with us to pack it up and take it away to join the eight million other insect specimens in their collections! So it has gone to the New World – an area where I've never collected! Better than ending up on a bonfire, or being gradually eaten by other insects, I think! We're hoping for an invitation to visit there in due course!

Display frame of mainly New Guinean butterflies plus a Madagascan moth.

Photo
Tony Morton

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A sampler of *Castiarina* (Coleoptera: Buprestidae) diversity –

Peter J. Lang
c/- South Australian Museum
North Tce, Adelaide 5001

Castiarina, with around 500 recognised species, is Australia's largest jewel beetle genus. Their larvae are wood-borers and poorly known, while the adults, have evolved to feed on a range of nectar-producing plants and are mostly brightly coloured and conspicuous. This selection of images illustrates just some of the diversity of form and colour patterns found in South Australian *Castiarina*, together with the host plant species on which they were collected.

For further information on *Castiarina,* see:

- Barker, S. 2006. *'Castiarina: Australia's richest jewel beetle genus'* South Australian Museum & University of Adelaide. 341 pp.
- http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/taxa/Castiarina
- http://researchdata.museum.vic.gov.au/padil/jewels/castiarina.html

All images © Peter J. Lang

Castiarina aeneicornis, PL2040,
on *Leptospermum coriaceum*

Castiarina argillacea, PL0300,
on *Babingtonia behrii*

Castiarina bicolor, PL0193,
on *Leptospermum myrsinoides*

Castiarina chinnocki, PL0353A,
on *Eremophila scoparia*

Castiarina crenata, PL2422,
on *Leptospermum continentale*

Castiarina crux, PL0524,
on *Eucalyptus socialis*

Castiarina duaringae, PL0803A,
on *Eremophila scoparia*

Castiarina dugganensis, PL1534B,
on *Acacia ancistrophylla*

Castiarina erythromelas, PL2882,
on *Leptospermum continentale*

Castiarina erythroptera, PL0785,
on *Myoporum platycarpum*

Castiarina eyrensis, PL2568,
on *Acacia papyrocarpa*

Castiarina flava, PL2714,
on *Eucalyptus socialis*

Castiarina gardnerae, PL1412B,
on *Melaleuca lanceolata*

Castiarina gibbicollis, PL0830E,
on *Grevillea pterosperma*

Castiarina marginicollis, PL1065,
on *Eucalyptus porosa*

Castiarina pallidiventris, PL0308A,
on *Babingtonia behrii*

Castiarina tepperi, PL0836,
on *Grevillea pterosperma*

Castiarina vanderwoudeae, PL0168,
on *Eremophila scoparia*

The Fragile Web - *Wendy Benfer*

On 4th July 2014, 'The Fragile Web' was opened in the small country town of Blackbutt, 160 km north-west of Brisbane. The name speaks for itself. Fostering an appreciation of the 'Natural Heritage' of the area (and an awareness of the challenges it faces), as well as encouraging better stewardship of the planet, are core aims of 'The Fragile Web'.

Displays highlighting different environmental issues, photos of some of our native flowers taken along the Brisbane Valley Rail Trail by a local photographer, and information handouts help to present this message. Environmental books and grey-water friendly products (with a discount offered for a 'refill – not landfill') are for sale and, because man is part of this 'fragile web', there is a range of 'Fair Trade' items and ethically produced, hand-made gifts. These are promoted as a means of helping the developing-world's disadvantaged people work their way out of poverty without being exploited.

Although there are a few exotic trees in the garden, it is being extended with the addition of a number of local native plants, many of these being butterfly host plants. As well, an 'Incredible Edible' garden has been started at the rear of the building. There are vegetables and herbs already being harvested. The Incredible Edible movement started in 2008 in Yorkshire, UK. Although people are invited to help themselves from these gardens, it is not all about free food. Their purpose is to remind us that food can be grown close to home.

It is expected that this is just a beginning and that the Fragile Web will evolve as time goes on. Suggestions are already being made and are welcome. It is planned to have guest speakers and different activities on a regular basis. The first of these was held on 1st November when Helen Schwencke, co-author of 'Create More Butterflies', visited to give a talk, walk and evening light-trapping.

The building is situated on the main road through town (75 Coulson Street) and is presently open Monday, Wednesday and Friday afternoons (12pm to 4pm). I would be happy to open at other times by appointment. Phone 4170 0555 or email thefragileweb@gmail.com

"Humankind has not woven this web of life. We are but one thread within it. Whatever we do to the web, we do to ourselves. All things are bound together. All things connect". (Attributed to Chief Seattle)

Parts of the display at the Fragile Web
Photos Wendy Benfer

YOU ASKED

Peter Kuttner from Mt Tamborine wanted to know the identity of the attached lacewing from Mt T.
As there are no dedicated books nor websites he thought one of our readers may be able to help.

****

Photo John Moss

Q. This nest was found by a friend on the ground, having been blown out of a tree during a storm. It had been located high up in a eucalypt at Mount Cotton in the Redlands. I am curious to know what type of insect (bee or wasp?) has made this intricate structure, which measured 50cm x 35cm.

Lois Hughes

Ropalidia romandi subspecies *cabeti*
Photo Robert Ashdown

A. The structure is the nest of a social paper wasp, *Ropalidia romandi* subspecies *cabeti*, which is about 6-8 mm long. Its colour pattern is yellow and brown, with yellow stripes on black on the dorsum of the thorax. The nest, as can be seen in the photographs, consists of many layers of papery combs surrounded by an irregularly shaped paper envelope. These nests are usually attached to the underside of a large branch high up in a tree, usually a eucalypt. They eventually fall during a storm or when the tree sheds its bark. In this case we have heard that nest building began again shortly after this one fell and is rapidly growing in size.

What interests us is why the insects constantly extend the combs of their nest for production of new larvae and don't appear to use the old combs. Although they feed on nectar and are often seen on flowers, do they use the combs to store nectar like bees do for honey? They are also known to predate on caterpillars to feed their larvae, but how is this food processed?

Perhaps other readers could throw more light on their life history, including their food preferences. John Moss

Left - Outer paper covering (and showing branch attachment point) of nest of paper wasp *Ropalidia romandi* subspecies *cabeti*
Right - Nest of paper wasp *Ropalidia romandi* subspecies *cabeti* showing adult wasps
Photos by Richard Zietek published in his book "Social Wasps of Brisbane"

Metamorphosis June 2014 included a picture from John Mansfield of a woven case hanging from a branch.

On 24 April 2011, I saw the same structure at Wambool Nature Reserve, a few kilometres east of Bathurst, NSW, and sent my photo to the Australian Museum. They advised that it is almost certainly the egg sac of an Orb-Weaver Spider. Whilst there were adult Orb-Weavers there on the day (both females, and the much smaller males), the egg sac was at least 10 metres away from any adult spiders on their webs.

Wambool NR is at 970 metres altitude. It's dry sclerophyll woodland, of undulating hills and an open understorey, some bare areas but mainly with lovely shrubs and herbs.

Irene Denton

Photo Irene Denton

Ed: John Marshall is still waiting for something to emerge from the egg sac he photographed.

LETTER

When we were on holiday in Western Victoria earlier this year, we came across this large exterior placard on the site, of all places, the public convenience in a tiny town between Camperdown and Cressy – possibly Foxhow (at any rate in the Lake Corangamite area).

The text encapsulates the life history and distribution of the 'critically endangered' Golden Sun Moth (*Synemon plana*).

It seems unusual (but gratifying) to see the Colac-Otway Shire publicizing the awareness and protection of a lepidoptera species, and I thought it was worth recording for interest's sake. With best wishes Alan Hyman

From issue #24 March 2002

The Bright Cornelian Butterfly - *Deudorix diovis*: A bit of unsolved science in our own backyard.

The Bright Cornelian (*Deudorix diovis*, pronounced Due-dor-ix die-o-vis), is a member of the Lycaenid or "Blues, Coppers and Hairstreaks" butterfly family. It occurs only in Australia and Papua New Guinea (Parsons, 1999); in Australia, it occurs at Darwin and Coen, and sporadically from Atherton, North Queensland, south to the Gosford and Sydney regions of New South Wales, with the possibility of breeding populations occurring further south (Braby, 2000).

The genus *Deudorix*, to which the Bright Cornelian belongs, contains some 70 species commonly named 'Cornelian' and 'Playboy' and is found in most regions of the Australian and Indo-Malayan archipelagoes.

There have even been several recent additions to this genus of butterflies from the Solomon Islands and Papua New Guinea (W.J. Tennant, 2000).

The Bright Cornelian was once considered a subspecies of the Dull or Northern Cornelian (*Deudorix epijarbis*), which occurs in North Queensland. However, it was found that both Cornelians occurred together; in North Queensland larvae of both species have been found on the same host plant, indicating that the Dull and Bright Cornelians are separate species. Subsequently, the Bright Cornelian has been assigned a specific rank (*D. diovis*), whilst the Dull Cornelian (*D. epijarbis dido*) remains a subspecies of the species *epijarbis*.

The Bright Cornelian is an enigma, with many aspects of this species biology unknown until relatively recently. Once considered a generally uncommon, rarely seen species (Common and Waterhouse, 1981), the Bright Cornelian is now considered a fairly common, although local, species. Its success is most likely due to the introduction of two of its many host plants to streets and gardens, specifically *Cupaniopsis anacardioides* (Tuckeroo) and *Harpullia pendula* (Tulipwood). These two species are commonly planted as street trees, particularly on the Sunshine Coast and in Brisbane. A particularly good place to see this butterfly in Brisbane is along the Brisbane River in front of the Queensland Museum, where its host *Cupaniopsis anacardioides*, the Tuckeroo, grows along the riverside pathway. This species has also been known as a minor pest of Macadamia Nuts (*Macadamia integrifolia*) and Litchis (*Litchi chinensis*). Lindsay Popple has also reared a specimen from *Diploglottis australis* (L.Popple, pers. comm.). Like most members of the Cornelian group, the Bright Cornelian is a rapidly flying species, with the two sexes spatially separated (i.e., the male and female butterflies occupy different positions within an overall habitat). For example, the males of this species stake out territories on or around its host tree, perching head down on tall trees, fiercely defending their turf with the full spirit of a World War Two fighter pilot! Any insect, particularly other Lycaenids, daring to enter the territory of this species will be immediately engaged in

a spectacular mid-air dogfight, with the insects flashing across the sky, in line, wings beating furiously. It is therefore no wonder that males collected in the wild are frequently damaged or worn!

In contrast to the rapidly flying males, the females are damsels of the treetops, gently fluttering about inside the canopy of its host plant, seeking out the fruits upon which the ova are laid. The life history of this species, although well mentioned in literature, is incomplete, with the author preparing a full description for publication soon.

The ova are very comparable to a mandarin in both shape and shell patterning (the shells of many insect eggs are often adorned with intricate patterns formed by ribs and depressions) and are laid directly on the fruits of its host plants. Usually, the site of oviposition is in the well-defined clefts or sutures on surface of the fruits. However, ova have also been observed inside the fruits of *Harpullia pendula* previously attacked by larvae of this species, the female ovipositing through holes bored by previous larvae.

The larvae of this species attack the fruits of their hosts by boring into their flesh. In *Harpullia pendula*, the fruit is encapsulated by a thin shell, through which the larvae also bore, allowing females to oviposit inside the shell as well as in external clefts. The larvae feed on the insides of fruits of all hosts, frequently completely eating out the insides of the fruits themselves. In *H. pendula*, the entire fruit is eaten (hence the numerous empty pods found on street trees) and, in times of limited food, the shell may be completely eaten (observed in captivity only). This species also attacks the Macadamia Nut, with larvae observed attacking even the maturing nuts of this species.

Larva of *Deudorix diovis*
Sketch by John Neilsen

The larvae themselves are slug-like and quite colorful, the early instar larvae (Nielsen, in prep.) being light yellow with light brown or orange bands and are covered in numerous semi-translucent hairs, or setae. The mature larvae are distinctly different, being dark orange with a blue-grey border.

The species pupates either in the hollowed out fruit/shell of its host or in leaf litter at the base of the tree, with the latter appearing to be more common with the Tuckeroo. However, on Macadamia Nut, the species appears to pupate exclusively inside the fruits, with pupation in leaf litter not yet observed, although quite possible.

The larvae and pupae of this species have occasionally been found to be attended by the Coastal Brown Ant (*Crematogaster*? sp), and another unidentified species of ant (*Iridomyrmix*? sp.), which has been recorded by photographs lent to the author by Dr. Bert Orr. Other ants recorded in attendance with this species are listed by Braby (2000).

As is quite clear, much work is required on this species. I have been 'about to publish' the previously undescribed early instar stages of this species' life history and biological observations since 1999, but every time I solve an existing problem or

revise my description of the larvae, a new problem to be solved arises. Like in all sciences, the more we discover about a particular subject, the more we find we don't know! ***John Neilsen***

References:
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Parsons, M. (1999) The Butterflies of Papua New Guinea their Systematics and Biology, Academic Press, Sydney, Australia.
Tennent, W.J. (2000) Notes on *Deudorix* Hewitson in the Solomon Islands, the Bismark Archipelago, and New Guinea, with descriptions of nine new taxa, The Australian Entomologist 27 (1): 9-26, Swift Graphics, Brisbane.

Acknowledgments: I would like to thank my family for collecting *Harpullia* seeds and feeding hungry *Deudorix* larvae during a trip to Canberra, for coping with the *Ornithoptera* setting on the table, the entomological cabinets taking over the living room, the expeditions to Buderim Forest Park and enduring the smell of naphthalene in the house for the last 10 years. John Moss, Donald Sands, Albert Orr, Geoff Waite, Graham Forbes and Michael Rix are all thanked for their valued inputs and changes to the forthcoming paper on this topic.

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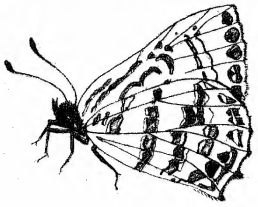
From Issue #21 June 2001

New Site for Rare Bulloak Jewel, *Hypochrysops piceata*



The writer attended the Queensland Naturalists' Club 2001Easter camp from April 13th-16th April which was held at the cattle property of Gavan Lahey, situated about 35 km north-east of Goondiwindi. The country is a patchwork of eucalypt woodland on loamy soil, Bulloak and "Cypress" pine forest on poor sandy soil and Brigalow/Belah on heavy black clay soils. Adjoining the property on the south is the 11,000 acre Bendidee State Forest and the 2,000 acre Bendidee National Park – both of which contain undisturbed representatives of these forest types. In particular there are some large mature Belahs (*Casuarina cristata*) and Bulloaks (*Allocasuarina luehmannii*).

The writer considered the latter habitat suitable for the small and rare "Darling Downs" (now "Bulloak") Jewel (*Hypochrysops piceata*) as mature borer-holed Bulloaks, the host tree, were present as well as colonies of the butterfly's attendant ant, the repulsive smelling *Anonychomyrma* sp (*itinerans* group).

Subsequently, with assistance from son Ronald and fellow Nat. Jill Don, the Bulloak treetops were scanned with binoculars for evidence of the little butterfly. Once the

first one was spotted, many others soon appeared – some flying with the usual silvery appearance, and others resting characteristically head down on flimsy branchlets at the top of the trees. Some also flew around and perched on adjacent Angophoras. At one stage a female flew right down to within less than a metre from my face – unfortunately without my net handy it was not possible to collect this as a voucher specimen, but it did confirm the identity with certainty.

Currently this butterfly is known only from a limited area on the Darling Downs at Leyburn. The butterfly has not been seen in recent years at its original collecting site at Millmerran, which is between Leyburn and this new site at Goondiwindi. There have been other unconfirmed sightings at Cecil Plains (M. DeBaar pers.com.) and a single roadside sighting nearer to Goondiwindi (D. Sands pers.com.). It quite possibly exists in the vast Barakula State Forest to the north of Chinchilla where there are still scattered stands of mature Bulloak. **John Moss**

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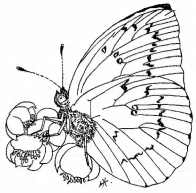
From issue #16 March 2000

Plant Profile - *Senna surratensis*

It's not often one finds a butterfly host plant that is reliable and also performs well in a traditional garden but this is one of them. It had been languishing in my garden for many years, an ugly duckling which has now become a beautiful swan.

This plant has had many name changes through the years as have some of the other plants once known as cassias. This and the cultivation of some foreign cassias has created a bit of confusion about the correct name of this particular plant. When I bought mine it was called *Cassia retusa*, the climbing cassia. Accordingly I planted it in the shade of another tree and waited for it to do its climbing thing. It didn't. It tried to become a shrub and only flowered occasionally.

Neither did it attract any Yellow Migrant butterflies to my yard. This butterfly is very similar to the lemon migrant but its outside wings are a more rich golden yellow. The inside forewing is white while the hindwing is golden and once you learn to look for this difference it becomes easy to separate them.



Yellow Migrant

When I saw this plant growing in another members garden I realised my mistake. His plant was growing in full sun and it was flowering profusely. He also confirmed that his plant had had yellow migrants breeding on it.

Shortly after that I removed the tree that shaded my Senna. It wilted at first but then recovered to put on a spurt of growth. About the time it started forming the first flower buds we had a yellow migrant butterfly move in and soon the plant was covered in lots of eggs.

Now that my plant is growing in the sun it looks a lot like the garden plant commonly called the Easter Cassia because of its habit of flowering around Easter. The Easter

cassia has round seed pods compared with the flat seed pods of *Senna surattensis* and is not a host of the yellow migrant.

The story does not end yet.

Senna surattensis is one of a group of plants that has evolved an unusual method of pollination called buzz pollination. Instead of having pollen on the outside of the stamens it occurs bottled up on the inside of the stamens. Any insect wishing to collect this pollen must vibrate the stamen until the pollen is released. European honeybees don't do this very well thereby leaving this valuable resource available for those native bees able to buzz pollinate flowers.

In my garden at least five different species of native bees are able to accomplish this trick and can often be seen buzzing around the flowers. I have not had the heart to catch any and send them away for scientific identification. There is one large yellow and black carpenter bee and a very small version of this bee. There is a medium sized banded orange bee and two different species of blue-banded bees. Sometimes it gets quite crowded and some of the bees appear to be trying to head butt each other. Also a leafcutter bee came and cut away pieces of the leaves for its nearby nest. I did not see this bee visiting the flowers.

This is a versatile plant is easily propagated from seed though it can grow slowly at first. It is a great addition to any butterfly garden. ***Frank Jordan***

BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

Planning and General Meeting

What: **details please**
When: Saturday from 10 am
Where: – address provided on RSVP
Who: All members are welcome.
RSVP: Ross Kendall on 07 3378 1187, 0402 254 370 ross@butterflyencounters.com

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The magazine seeks to be as scientifically accurate as possible but the views, opinions and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

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We would like to thank all these people for their contribution.

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